PLEASE LEAVE THIS MANUAL WITH THE *OSO* UNIT AFTER INSTALLATION

EPCI 360

INSTALLATION MANUAL

The EPCI is an indirect unvented cylinder designed and approved for use with a heat pump. The cylinder is made of a double cylinder construction with a primary buffer vessel in the lower section and an indirect domestic hot water cylinder in the upper section. The buffer vessel provides a store of heat for the space heating system. The heating coil has been specifically designed for a heat pump, information is included in this manual to link the cylinder with the heat pump.
This cylinder is manufactured and approved in accordance with EN 12897:2006.
This manual gives detailed advice for installation and should be read carefully prior to fitting any unvented unit. Where components are supplied only for indirect units, this is clearly shown.
This OSO cylinder must be installed by a competent person and be installed in compliance with the OSO Installation and Maintenance Instructions, all current legislation, codes of practice and regulations governing the installation of unvented hot water cylinders in force at the date of installation.

Components supplied with the unit for site fitting

(See also page 2 for component list)

* Multibloc valve, includes pressure reducing valve, line strainer, balanced cold water take off, ***(for shower or bidet only)*** check and expansion valve.
* Tundish
* 1/2"F x 15 x 15 tee piece
* 2 flexible hoses - 220 mm & 1000 mm
* 1" x 22mm Elbow / Drain Cock
* 2 sensor pockets
* Motorised valve
* Expansion vessel.

Components factory fitted

* Immersion heater
* Thermostats / thermal cut-out
* Temperature and pressure relief valve.

Health and Safety
Manual Handling Operations Regulations 1992 defines manual handling as: "any transporting or supporting of a load (including the lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force". The Regulations set no specific requirements such as weight limits. However common sense still has to be used based on an ergonomic approach for each individual.

DIMENSIONS AND WEIGHTS TABLE 1

PRODUCT REF.	360
HEIGHT	1950
DIAMETER	580
WEIGHT EMPTY	86
MAX WEIGHT FULL	427

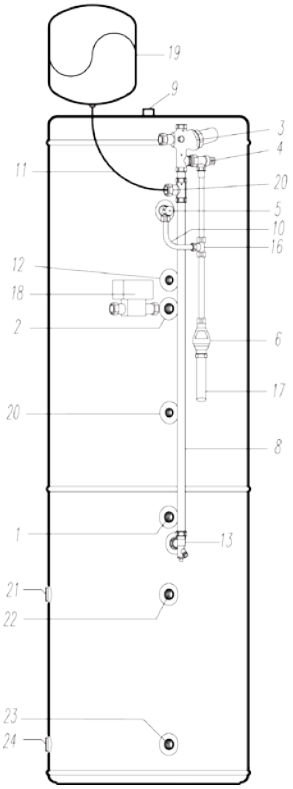
Installation details

The OSO unvented unit is designed for use with supply pressure up to 10 bar. For pressures over 10 bar an additional pressure reducing valve must be fitted in the supply pipe to the unit.

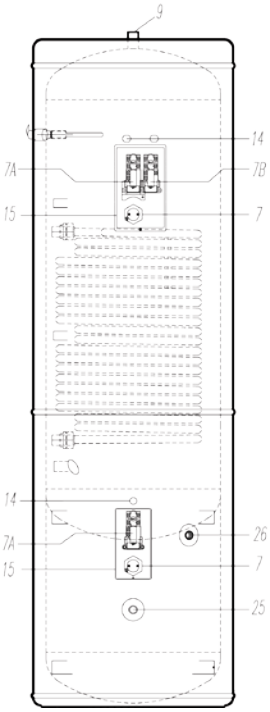
142038-00

General Layout Fig: 1

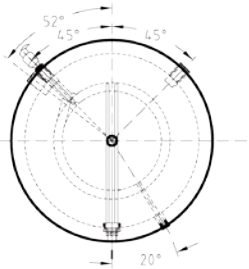
EXTERNAL VIEW



CUTAWAY VIEW



PLAN VIEW



KEY		Part No.
1	Return 3/4" BSPF	
2	Flow 3/4" BSPF	
3	Pressure Reducing Valve	355013
4	Expansion valve	510505
5	Temperature and Pressure Relief Valve	550853
6	Tundish	219002
7	Immersion Heater	71259
7A	Thermostat Immersion Heater	80020
7B	Cylinder Thermostat	80020
8	Cold Feed Tube (Not supplied see Table 2)	
9	Hot Water Outlet 3/4" BSPF	
10	Flexible Hose	202108
11	Flexible Hose for Expansion Vessel	91911
12	Secondary Return Connection Blanking Plug / Sensor Pocket 1/2"	

KEY		Part No.
13	Elbow / Drain Cock	250445
14	Cable Entry	
15	Electrical Box	
16	Tee Piece	250006
17	Discharge Pipe (Not supplied)	
18	Motorized Valve M (Not Factory Fitted)	92000
19	Expansion vessel	AX 19
20	Sensor Pocket 1/2"	
21	Buffer vessel flow from heat pump 1"	
22	Buffer vessel flow to heating circuit 1"	
23	Buffer vessel return from heating circuit 1"	
24	Buffer vessel return to heat pump 1"	
25	Pressure Gauge Connection 1/2"	
26	Thermostat Pocket 1/2"	

TABLE 2

Size	Lenght of tube (ø22) mm	Exp. vessel pre charge
355	1020	2,5 bar

COLD WATER SUPPLY

1. To obtain the best performance from your OSO unvented system it is advisable to feed the unit with an uninterrupted supply.
2. Before connecting to the multibloc, flush the cold supply pipework of all flux and debris.
3. Locate the water heater in a suitable position to facilitate the installation of the cold water supply, discharge fittings and pipework. Also take into account access to the immersion heaters and the commissioning valve.
4. Fit the combined male elbow drain cock to cold supply point (13), so that the compression fitting is vertical.
5. Fit both 1/2" male solar sensor pockets to the Solar Sensor bosses (19).
6. Fit the female outlet of the tee piece to the temperature and pressure relief valve (5) with the horizontal connection facing right at approx. 45°.
7. Fit the tundish (6) to the tee piece using a short length of 15mm copper tube.
8. Fit the length of copper tube 22mm specified in Table 2 to the cold feed elbow (see 4 above) to include a T piece (20) for expansion vessel flexible hose.
9. Fit the pressure reducing valve (3) to the top of the copper tube (see 8 above), so that the black knob is facing right.
10. Connect the flexible hose to the 1/2" outlet of the expansion valve (4) and the horizontal outlet of the tee piece (see 6 above). Discard compression nut & ring.
11. If a balanced mains pressure cold water supply is required to a **shower or bidet (over rim type only)**, remove the blanking cap from the pressure reducing valve (3) and connect to the shower or bidet cold supply. ***Using the balanced cold connection to feed bath taps can reduce the flow available to the unvented cylinder. (Major shower manufacturers advise fitting a mini expansion vessel in the pipework to accommodate thermal expansion and prevent tightening of shower controls)***
12. Connect the cold supply to the Multibloc (3).
13. Fit the expansion vessel to the wall close to the water heater using the enclosed mounting bracket. Connect the expansion vessel hose to the T piece in the cold feed pipe to the cylinder. The expansion vessel is supplied with the OSO unit, fit as shown on page 2.

Hot water supply

14. Connect the hot water supply pipe to the outlet (9). Ensure connection is water tight.

Secondary return (optional)

15. Connect secondary return if required to fitting according to diagram on page 16.

Discharge pipe

16. Connect the discharge pipe from the tundish (6). This must have a continuous fall and be fitted in accordance with The Building Regulations (see page 16). The tundish should be installed away from electrical devices.

Primary flow & return & motorised valve - heat pump

17. The heat pump primary flow and return connections should be made to the unit. The motorised valve can be connected to wither the primary or return connections. The primary flow and return connections are ¾" female. The valve has 22mm copper connections. The direction of the primary flow in the coil is top to bottom.

18. Connect the primary flow and return from the heat pump into the heating circuit using the connections 21 – 24 in the buffer vessel section of the EP unit. This will provide a store of heating fluid to supply to the heating circuit that will improve the efficieny of the heat pump.

COMMISSIONING

Filling up

1. Open a hot tap.
2. Open the cold water supply valve
3. when water flows from hot tap, close the tap
4. Allow the system to stabilize for 5 minutes
5. Open each hot water tap in turn to expel air from the system pipe work.
7. Check for leaks.
8. Manually operate Temperature and Pressure Relief Valve (5) to ensure free water flow through discharge pipe. (Turn knob to left.)

Draining/flushing

1. Turn off mains supply.
2. Connect hose pipe to drain cock at base of cylinder.
3. Open hot tap. Open drain valve and open temperature & pressure relief valve.
4. Allow to drain. Follow commissioning instructions (above) to refill.

SAFETY AND MAINTENANCE

Safety Cut-out

1. The safety cut-out operates if:

a. Wiring is incorrect.

b. The immersion heater thermostat or cylinder thermostat fails.

c. Thermostat is set too high.

2. Remember before resetting the safety cut-out or altering the thermostat setting, isolate electrical supply to the unit prior to removal of the electrical box lid.
3. Reduce thermostat setting and press the reset button. After adjustments are completed, ensure the lid to the electrical box is replaced correctly and the retaining screw is fitted.
4. If still out of operation, contact installer.

RECOMMISSIONING INSTRUCTIONS

Cold or tepid water discharge from tundish - The tundish should be installed away from electrical devices.

1. Close cold water supply valve
2. Open a hot tap.
3. Repressurise the expansion vessel air charge to its set level.
4. Close hot tap
5. Open the cold water supply valve

Hot water discharge from tundish

This indicates a malfunction of a thermal cut-out, operating thermostat or the combined temperature and pressure relief valve. Turn off the electrical supply to the immersion heater and also isolate an indirect unit from the boiler. Contact the installer or competent engineer.

TABLE 3

Size litres	Max. design pressure	Operating pressure CW feed & coil	Pressure drop primary heater (coil)	Temp. / pressure relief valve	Safety valve Pressure / conn.	Exp. vessel capacity
355	8 bar	cw in 2 bar, coil 2.5 bar	0,1 bar	90-95°C / 10 bar	8 bar / 15mm - 1/2"	19 l.

INSTALLATION AND SERVICING INSTRUCTIONS

Positioning the unit
The water heater should be fitted level on a hard surface with sufficient load strenght to take the full weight of the cylinder (see table 1 page 1). Adjustable feet are fitted to ensure the unit can be adjusted to a level position. There is no limitations regarding the fitting distance from walls etc., but it is strongly recommended to ensure easy access to all pipe fittings etc. There should be at least 80 cm of free space in front of the water heater to ensure easy access for servicing and maintenance.

Protection from frost
If the water heater is in danger of being exposed to frost while not operating under electric power, the unit must be drained to avoid damage. Make sure the electric power is turned off before draining, otherwise the heating elements can be damaged and the warranty is void. Draining instructions, see "Commissioning" on page 4.

Cold water inlet control (Multibloc) See Page 2 Items 3 - 4
This combination consists of a pressure reducing valve with integral strainer, check valve and expansion valve with stainless steel seat. The pressure settings are set and locked in the factory and are shown on the top of each valve. For optimum performance the following installation instructions should be complied with.

Installation
1. Cold water supply to be 22mm nominal size.
2. Flush supply pipework before connection to remove all flux and debris prior to fitting the inlet controls. Failure to do this may result in irreparable damage to the controls and will invalidate the warranty.
3. The "MULTIBLOC" can be fitted in any orientation to suit the installation as long as it is fitted in the correct flow direction. Check the flow arrows on the side of the body.
4. The expansion valve should be either horizontal or pointing downwards. If fitted upwards, debris may be deposited on the seat and cause fouling of the seat when the valve operates. Check direction of flow arrows.
5. The black plastic plugs in the body are pressure gauge connections to enable pressure monitoring to be carried out, should the system develop a fault. It is recommended that these be accessible (the pressure reducing valve has two - only one need be accessible).
6. Expansion relief drain pipework must be connected to a safe visible discharge point via a tundish and the pipework must have a continuous fall.
7. The pressure reducing valve has two outlets, the second one is for a balanced cold water supply, to a shower or a bidet ***(over rim type only, ascending spray type requires type AA, AB or AD air gap). (Major shower manufacturers advise fitting a mini expansion vessel in the balanced cold supply to accommodate thermal expansion and prevent tightening of shower controls).***
   Using the balanced cold connection to feed bath taps can reduce the flow available to the unvented cylinder. If not required the balanced cold supply is blanked off.
   The Benchmark Log Book enclosed with the cylinder should be completed after commissioning of the system and handed to the customer for future use.

TABLE 4

Product code	DHW actual capacity (l.)	Primary Buffer actual capacity (l.)	Weight empty	Weight full	Heat-up (mins) coil	Rating (kW) coil	Heat loss kWh/24h	Primary flow rate	Hot Water Capacity (l.)
EPCI 360	258	94	86	427	23	27,6	2,1 / 0,8 (upper/lower)	15 l/min. - 80°C	208

Note: Temperature rise is from 15 to 60°C. Coil heating performance based on a primary flow rate of 15 l/min. at 80°C.

MAINTENANCE

It is recommended that annually a competent person
(a) Inspects and cleans the line strainer.
(b) Checks the operation of the expansion relief valve and temperature & pressure relief valve.
(c) Recommissions the cylinder in accordance with the instructions on page 4.

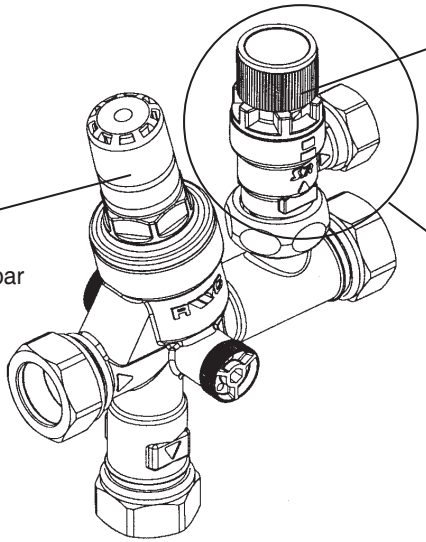
Corrosion resistance
Duplex stainless steel is naturally corrosion resistance to mains water supply. No specific maintenance is required to maintain this resistance. Please see guarantee terms for permissable water content. Please note: OSO cylinders are not guaranteed for use with a private water supply.

The immersion heater can be removed to provide visual inspection access to the cylinder.

Pressure reducing valve
1. Isolate the cold water supply
2. Unscrew the pressure reducing cartridge
3. Clean the filter mesh and the cartridge under running water.
4. Replace cartridge ensuring that strainer is correctly located and reassemble the unit. Pressure Reducing Valve cartridge and strainer Part No. REDC355013 2.1 Bar.

Expansion relief cartridge
1. Isolate the cold water supply.
2. Unscrew blue expansion relief headwork from valve body.
3. Clean valve seat face and seating - do not scratch or damage either seat face or seating.
4. Refit in reverse order. Do not overtighten Expansion valve cartridge and seat Part No. 214009 8.0 Bar. Complete Expansion Valve Part No. 510 505 8.0 Bar.

SPARE PARTS



Tundish
Install theTundish in a vertical position within a maximum of 600mm from the temperature and Pressure Relief Valve drain connection. Ensure the expansion relief pipework discharges through the tundish. Tundish pipework must be 22mm with a minimum vertical length of 300mm below tundish. Maximum permitted length of 22mm pipework is 9m. Each bend or elbow is equivalent to 0.8m of pipework.
All pipework must have continuous fall and discharge in a safe, visible position. If any doubt, refer to *Building Regulation G3.*

ELECTRICAL INSTALLATION

Immersion heaters
The EPCI is provided with twin immersion heaters. The upper immersion heater is designed as an auxiliary heater to supplement the heat pump energy and will ensure the top section of the water heater is fully heated.
All EPCI units are supplied with an immersion heater at low level. This immersion heater is to allow full heating of the entire cylinder should it be required for cleansing purposes. The lower immersion heater should not be in regular use as this will severely compromise the heat pump efficiency of the cylinder.

Wiring instructions for the immersion heater is located on the reverse side of the lower lid. Follow the wiring instructions connecting the live, neutral and earth as indicated. The electrical connection to the immersion heater must conform to current IEE wiring regulations. The unit must be permanently connected to the electrical supply through a double-pole linked switch with a minimum break capacity of 13 amps. All internal wiring is factory mounted. Each immersion heater has a working thermostat adjustable between 40°C - 70°C. A safety cut-out is also incorporated within the thermostat and will operate at 85°C ± 3°C. Should this happen, press the reset button.
Important: Before resetting the safety cut-out or altering the thermostat setting, isolate electrical supply to the unit prior to removal of the lid. Ensure the lid to the electrical box is replaced correctly and the retaining screw is fitted.

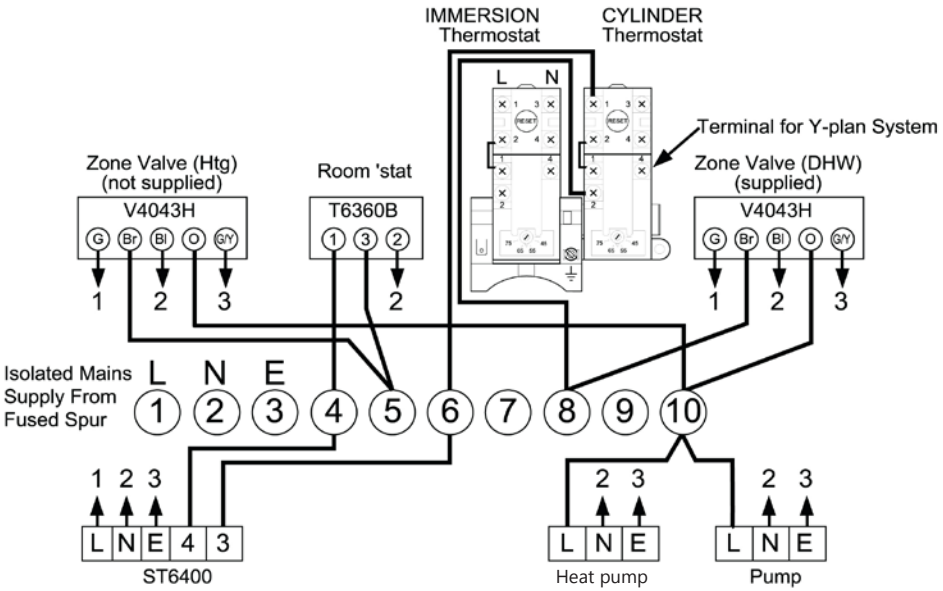
Heating coil
Heat sources to unvented hot water cylinders must be controlled by a thermal cut-out as well as a thermostat. The OSO EPCI is supplied both with bosses for solar sensor pockets and the pockets themselves.
The top half of the thermostats fitted to the cylinder is a thermal cut-out. The heat pump controller (not supplied) and heat pump sensor point should be wired through the OSO thermal cut-out. See fig. 4 pages 8 & 10.

Please note that the direction of flow in the heat pump coil is reversed compared to the boiler coil. If the cylinder is not being used for heat pump use, connect the boiler to the lower coil with the primary flow in a bottom to top direction.

OSO Hotwater (UK) Limited can not be responsible if alternative wiring plans are used.
Important: Before resetting the safety cut-out or altering the thermostat setting isolate electrical supply to the unit before removal of the lid.

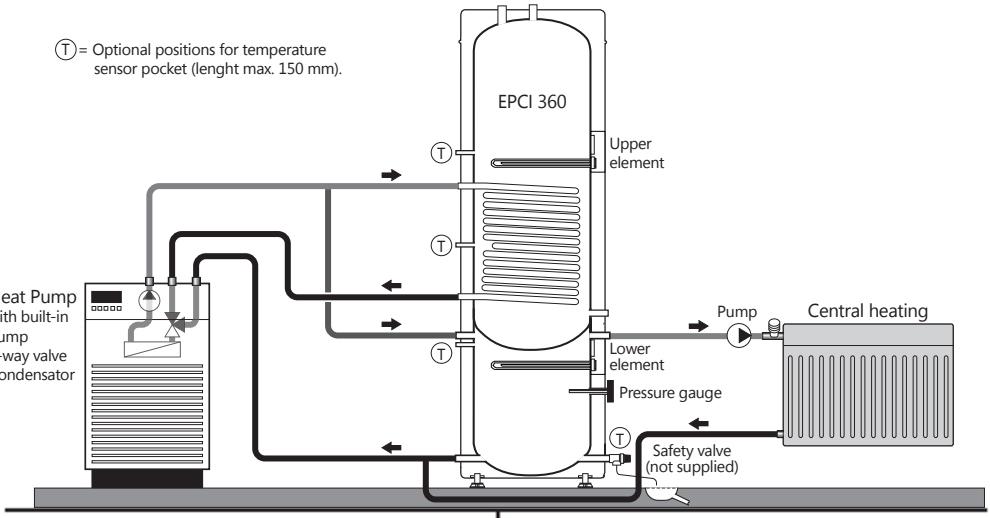
Wiring Layout for heat pumps controlled by S-plan system

If the heat pump is designed for control by a traditional S-plan wiring system, incorporating cylinder and room thermostats and motorised valves, follow the wiring plan below.



The wiring plan shown is based on the use of a 10-way Junction Box (Honeywell Part no. 42002116-001)
Junction Box terminal 10 is switched live and, if needed, terminal 9 is pump live.

Wiring Layout for heat pumps controlled by S-plan system



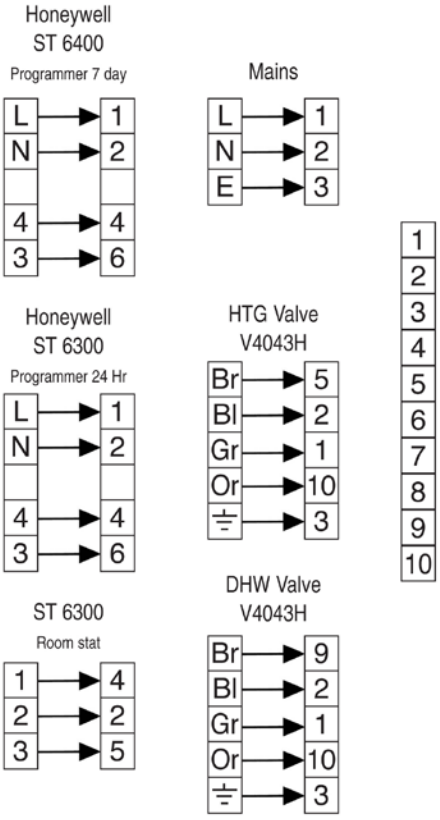
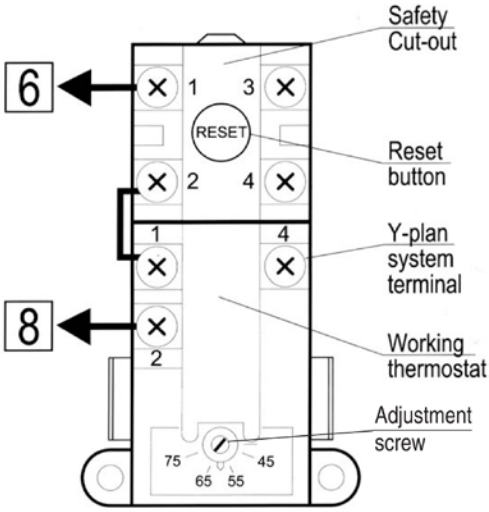


FIGURE 2



Cylinder thermostat located in electrical box

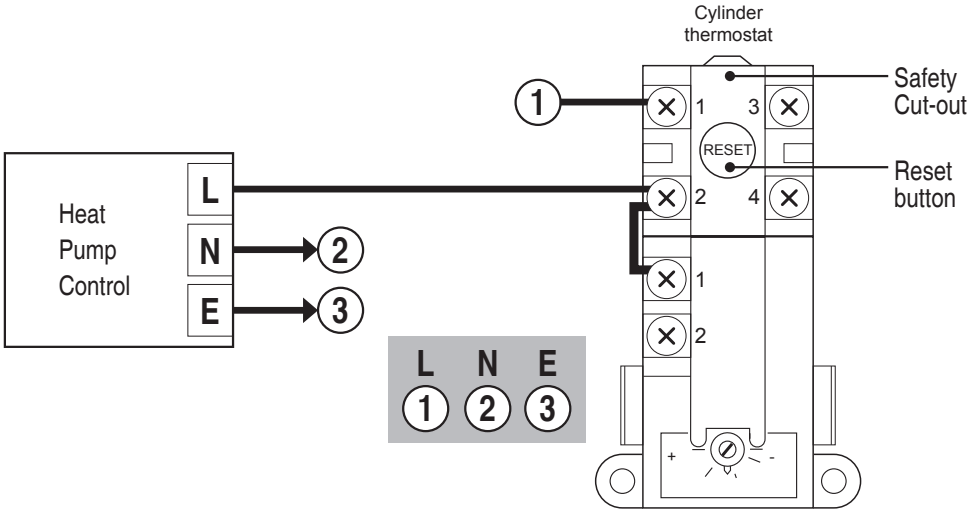
Electrical spare parts:

Direct units		Indirect units	
Thermostat	80020	Right thermostat	80030
		Left thermostat	80020
Immersion heater	71259	Immersion heater	71259

Wiring Layout for heat pumps controlled by integral thermal sensors

If the heat pump is designed for control using temperature sensors placed in the rooms and on the water heater, follow the wiring plan below.
The OSO EP is supplied both with bosses for solar sensor pockets and the pockets themselves. To comply with regulations governing the installation of indirect unvented cylinders, cylinders must be protected by a thermal cut-out as well as controlled by a thermostat.
The cylinder is supplied with a separate working thermostat which contains a thermal cutout. The top half of the thermostat is a thermal cut-out. If the cylinder temperature control is to be governed by thermal sensors, the heat pump temperature control mechanism must be wired via the thermal cutout on the cylinder. Follow the wiring diagram below.

HEAT PUMP CONTROLLER WIRING

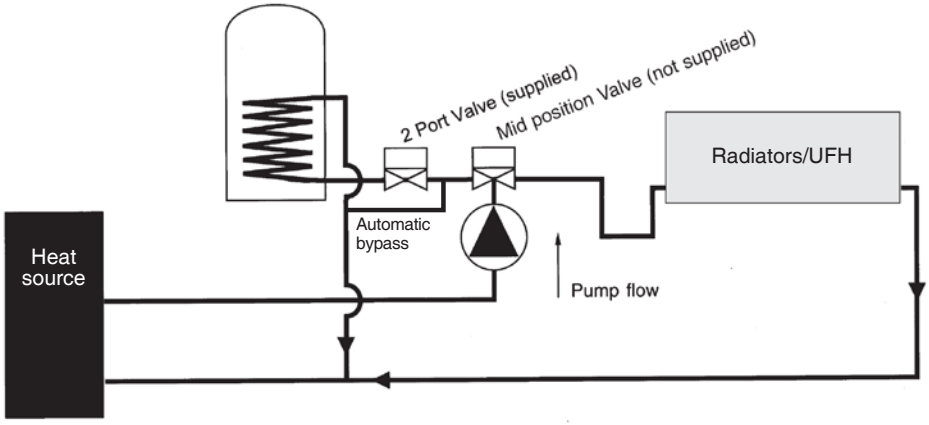


Electrical spare parts:

Immersion Heater	71259
Immersion Heater Thermostat	80020
Coil Thermostats	80030

A motorised valve must be fitted in the primary flow. Your OSO unit has been supplied with a two port motorised valve, which will act as a positive energy cut-out should the safety cut-out operate.

Y Plan System Schematic



If using a 6-wire 28mm or 1" BSP V4043H on either circuit the white wire is not needed and must be made electrically safe.

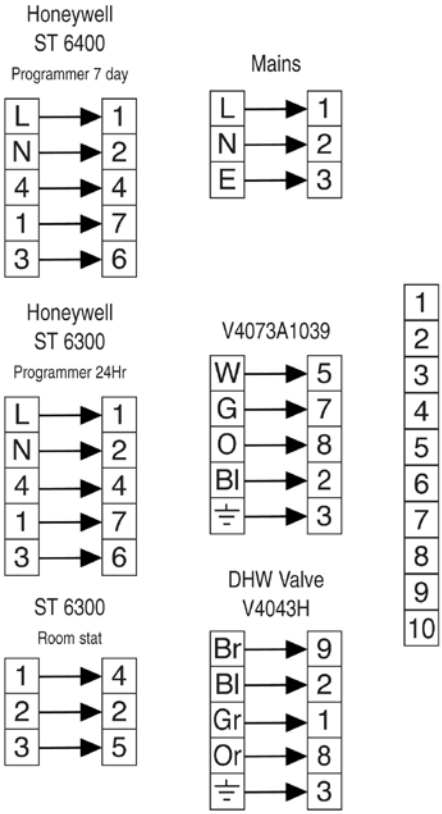
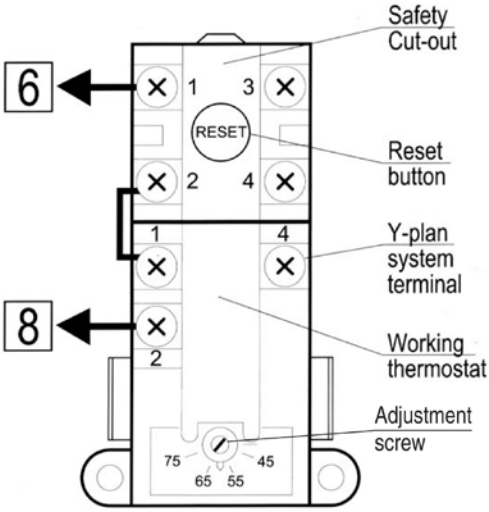


FIGURE 2



Cylinder thermostat located in electrical box

Electrical spare parts:

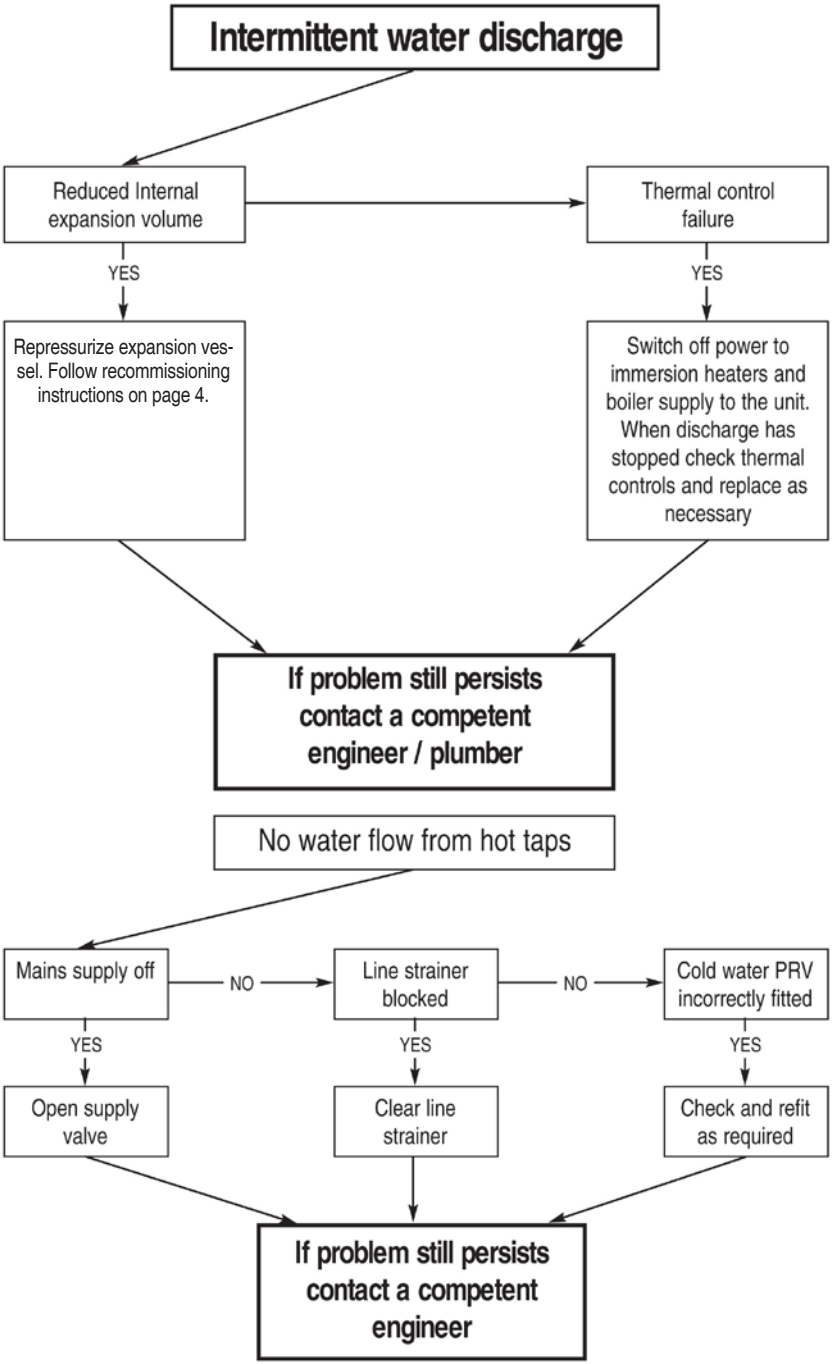
Direct units		Indirect units	
Thermostat	80020	Right thermostat	80030
		Left thermostat	80020
Immersion heater	71259	Immersion heater	71259

OSO FAULT FINDING GUIDE

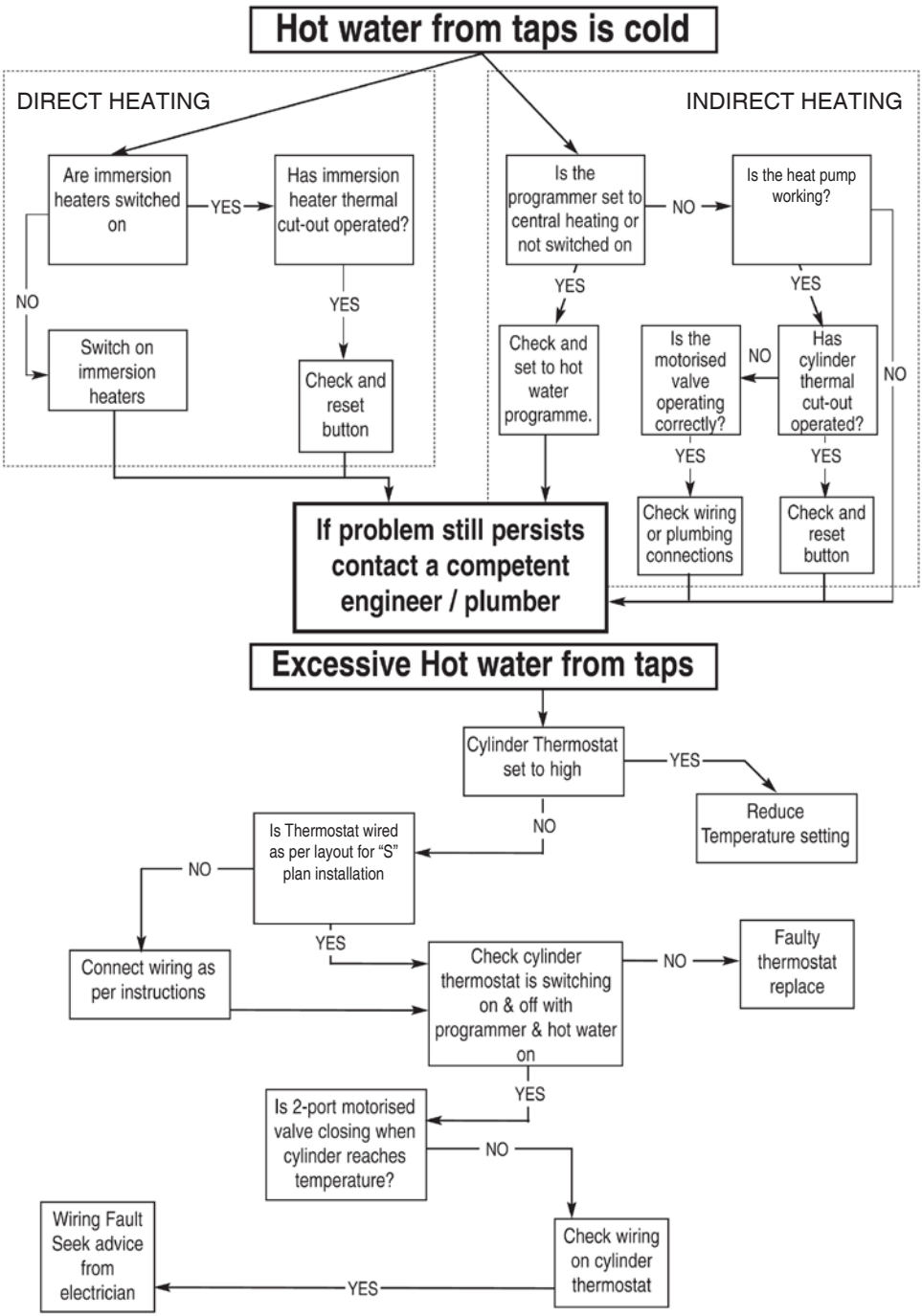
FAULT	POSSIBLE CAUSE	REMEDY
No water flow from hot taps	1. Mains supply off. 2. Strainer blocked. 3. Cold water inlet Pressure Reducing Valve incorrectly fitted.	1. Check and open stopcock 2. Turn off water supply. Remove strainer and clean. (See Pressure Reducing Valve page 6 Installation Manual) 3. Check and refit as required, (see item 3 page 5 of installation manual).
Water from hot taps is cold.	1. Heat pump not activated. 2. Immersion heater not switched on. 3. Immersion heater thermal cut-out has operated. 4. Programmer set to central heating or not switched on. 5. Cylinder thermal cut-out has operated. 6. Motorised valve not operating correctly.	1. Check Heat Pump operation. If fault suspected consult installer or heat pump manufacturer. 2. Check and switch on. 3. Check and reset button (see thermostat diagram page 9 and safety cut-out on page 4 of installation manual). 4. Check and set to hot water. 5. As at No. 2. 6. Check wiring and/or plumbing connections to motorised valve. (See page 8 of the installation manual).
Intermittent water discharge.	1. Reduced expansion vessel charge. 2. Thermal control failure. (Note Water will be hot).	1. Repressurize expansion vessel. Follow recommissioning instructions on page 4. 2. Switch off power to immersion heater(s) and boiler supply to the unit. When discharge has stopped, check thermal controls, replace it faulty. Contact a competent person.
Continuous water discharge.	1. Cold water inlet Pressure Reducing Valve not working. 2. Temperature and pressure relief valve faulty. 3. Expansion relief valve not working correctly.	1. Check pressure from valve if greater than 2.1 bar replace. (See page 6 of installation manual). 2. As No. 2 of above. 3. Check and replace if faulty. (See page 6 of installation manual).

NOTE: Disconnect electrical supply before removing any electrical equipment covers

OSO FAULT FINDING GUIDE


Intermittent water discharge
Reduced Internal expansion volume
Thermal control failure
YES
YES
Repressurize expansion vessel. Follow recommissioning instructions on page 4.
Switch off power to immersion heaters and boiler supply to the unit. When discharge has stopped check thermal controls and replace as necessary
If problem still persists contact a competent engineer / plumber
No water flow from hot taps
Mains supply off
NO
Line strainer blocked
NO
Cold water PRV incorrectly fitted
YES
YES
YES
Open supply valve
Clear line strainer
Check and refit as required
If problem still persists contact a competent engineer

OSO FAULT FINDING GUIDE



If in doubt at any stage you must consult a qualified electrician

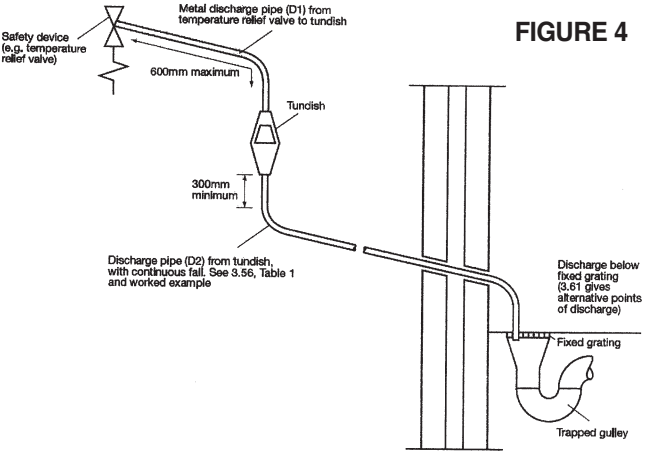
NOTES:

ALTERNATIVE DISCHARGE

Downward discharges at low level, i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc, are acceptable providing that where children may play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.

Discharge at high level, i.e. into a metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastics guttering system that would collect such discharges (tundish visible).

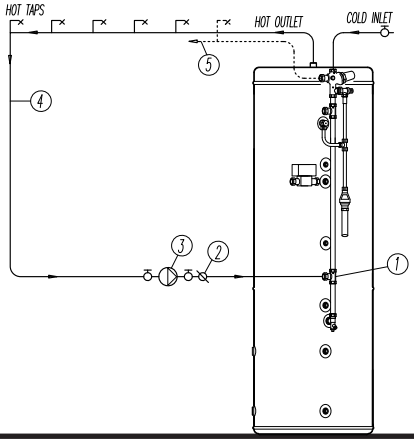
FIGURE 4


Metal discharge pipe (D1) from temperature relief valve to tundish
Safety device (e.g. temperature relief valve)
600mm maximum
Tundish
300mm minimum
Discharge pipe (D2) from tundish, with continuous fall. See 3.56, Table 1 and worked example
Discharge below fixed grating (3.61 gives alternative points of discharge)
Fixed grating
Trapped gulley

Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation discharging can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected. For further information contact your Building Control Office or The British Board of Agrément.

SECONDARY RETURN

FIGURE 5



1. Secondary Return Fitting (T piece not supplied)
2. Non Return Valve
3. Circulation Pump
4. Secondary Return Line
5. Balanced cold supply for showers or bidet only

All replacement parts must be supplied by OSO HOTWATER (UK) LIMITED.
To obtain the address of a local stockist contact:
OSO HOTWATER (UK) LTD.
E15 Marquis Court - Team Valley Trading Estate - Gateshead - Tyne&Wear, NE11 0RU
Phone: (0191) 482 0800 • Fax: (0191) 491 3655 • www.oso-hotwater.com

E-mail: technical.uk@oso-hotwater.com • spareparts.uk@oso-hotwater.com • sales.uk@oso-hotwater.com